

## **SECTION 09511 - ACOUSTICAL PANEL CEILINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes ceilings consisting of acoustical panels and exposed suspension systems.

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product specified.
- B. Samples for Verification: Full-size units of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
  - 1. 6-inch- (150-mm-) square samples of each acoustical panel type, pattern, and color.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Research/Evaluation Reports: Evidence of acoustical panel ceiling's and components' compliance with the 2000 International Building Code.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations for Ceiling Units: Obtain each acoustical ceiling panel from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- C. Source Limitations for Suspension System: Obtain each suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

- D. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
  - 1. Fire-response tests that were performed by UL, ITS/Warnock Hersey, or another independent testing and inspecting agency that is acceptable to authorities having jurisdiction and that performs testing and follow-up services.
  - 2. Surface-burning characteristics of acoustical panels comply with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
  - 3. Fire-resistance-rated assemblies, which are indicated by design designations from UL's "Fire Resistance Directory," from ITS/Warnock Hersey's "Directory of Listed Products," or from the listings of another testing and inspecting agency, are identical in materials and construction to those tested per ASTM E 119.
  - 4. Products are identified with appropriate markings of applicable testing and inspecting agency.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### 1.7 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

#### 1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size units equal to 2.0 percent of amount installed.
  - 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of amount installed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated for each designation in the Acoustical Panel Ceiling Schedule at the end of Part 3.

### 2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance.
- B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
- C. Panel Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3, including those referencing ASTM E 1264 classifications.

### 2.3 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
- B. Metal Suspension System Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3.
- C. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- D. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
- E. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
  - 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch- (2.7-mm-) diameter wire.
- F. Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.
  - 1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
  - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

3. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Comply with paint manufacturer's written instructions for applying and baking and for minimum dry film thickness.
  - a. Organic Coating: Manufacturer's standard thermosetting coating system with a minimum dry film thickness of 0.8 to 1.2 mils (0.02 to 0.03 mm).
  - b. Color: As selected from manufacturer's standard colors.
4. Available Manufacturers: Subject to compliance with requirements, manufacturers that may be incorporated into the Work include, but are not limited to:
  - a. Armstrong World Industries, Inc.
  - b. Celotex Corporation (The); Building Products Division; Architectural Ceilings Marketing Dept.
  - c. Chicago Metallic Corporation.
  - d. Fry Reglet Corporation.
  - e. USG Interiors, Inc.

## 2.4 ACOUSTICAL SEALANT

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard non-sag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirement:
  1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- B. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  1. PL Acoustical Sealant; Chemrex, Inc., Contech Brands.
  2. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
  3. SHEETROCK Acoustical Sealant; United States Gypsum Co.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and other conditions affecting performance of acoustical panel ceilings.
  1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

### 3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with publications referenced below per manufacturer's written instructions and Cisca's "Ceiling Systems Handbook."
  - 1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: ASTM E 580.
  - 2. Cisca's Recommendations for Acoustical Ceilings: Cisca's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings--Seismic Zones 0-2" for Zone 2B.
  - 3. UBC. Standard 25-2, "Metal Suspension Systems for Acoustical Tile and for Lay-in Panel Ceilings."
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or ceiling suspension system.
  - 2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions. Offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
  - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 5. Do not attach hangers to steel deck tabs.
  - 6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  - 7. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches (200 mm) from ends of each member.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
  - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  - 2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3 mm in 3.6 m). Miter corners accurately and connect securely.
  - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

- F. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
  - 1. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
  - 2. Paint cut panel edges remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
  - 3. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

### 3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

### 3.5 ACOUSTICAL PANEL CEILING SCHEDULE

- A. Ceiling Panels
  - 1. Water-Felted, Mineral-Base Acoustical Panels for Acoustical Panel Ceiling T1:
    - a. Available products include: Armstrong, Chamfered Cirrus/Celotex, Bevel Edge Cashmere Panel.
    - b. Classification: Panels fitting ASTM E 1264 for Type III, mineral base with painted finish; Form 1, water felted.
    - c. Pattern: Panels fitting ASTM E 1264 pattern designation (description) EI.
    - d. Color: White.
    - e. Noise Reduction Coefficient: NRC 0.65.
    - f. Ceiling Attenuation Class: Not less than CAC 35.
    - g. Edge Detail: Chamfered.
    - h. Thickness: 3/4 inch (19 mm).
    - i. Size: 24 by 24 inches (600 by 600 mm).
  - 2. Inorganic Acoustical Panels for Acoustical Panel Ceiling T2:
    - a. Available products include: Chicago Metallic, Terric.
    - b. Classification: Panels fitting ASTM E1264 for Type IX, mineral base; Cast or molded.
    - c. Pattern: Panels fitting ASTM E1264 pattern designation (description) EI
    - d. Color: White, integrally colored.
    - e. Noise Reduction Coefficient: NRC 0.50.
    - f. Ceiling Attenuation Class: CAC 35.
    - g. Edge Detail: Reveal.
    - h. Thickness: 7/8 inch (22mm).
    - i. Size: 24 by 24 inches (600 by 600 mm).

**B. Suspension Systems**

1. Suspension System for Acoustical Panel Ceilings T1:
  - a. Available products include: Armstrong, Suprafine.
  - b. Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, pre-painted, hot-dip galvanized according to ASTM A 653/A 653M, G01 (Z001) coating designation, with prefinished 9/16-inch- (14-mm-) wide metal caps on flanges; other characteristics as follows:
    - 1) Structural Classification: Intermediate-duty system.
    - 2) End Condition of Cross Runners: Override (stepped).
    - 3) Face Design: Flush face.
    - 4) Cap Material: Steel or aluminum sheet as standard with manufacturer.
    - 5) Cap Finish: Painted in color selected from manufacturer's standard designations.
2. Suspension System for Acoustical Panel Ceiling T2:
  - a. Available products include: Chicago Metallic, 1200 System.
  - b. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, pre-painted, hot-dip galvanized according to ASTM A653/A 653M, G01 (Z001) coating designation, with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges; other characteristics as follows:
    - 1) Structural Classification: Heavy-duty system.
    - 2) End Condition of Cross Runners: Override (stepped).
    - 3) Face Design: Flush face.
    - 4) Cap Material: Steel or aluminum sheet as standard with manufacturer.
    - 5) Cap Finish: Painted white.

END OF SECTION 09511